



1600

RAW SEQUENCE LISTING

DATE: 09/05/2003

PATENT APPLICATION: US/09/866,379C

TIME: 09:01:06

Input Set : A:\09010-029006.txt

Output Set : N:\CRF4\09052003\I866379C.raw

4 <110> APPLICANT: Short, Jay M.
 5 Kretz, Keith A.
 6 Gray, Kevin A.
 7 Barton, Nelson Robert
 8 Garrett, James B.
 9 O'Donoghue, Eileen
 10 Mathur, Eric J.
 11 <120> TITLE OF INVENTION: RECOMBINANT BACTERIAL PHYTASES AND USES
 12 THEREOF
 13 <130> FILE REFERENCE: 09010-029006
 14 <140> CURRENT APPLICATION NUMBER: US 09/866,379C
 15 <141> CURRENT FILING DATE: 2001-09-24
 16 <150> PRIOR APPLICATION NUMBER: US 09/580,515
 17 <151> PRIOR FILING DATE: 2000-05-25
 18 <150> PRIOR APPLICATION NUMBER: US 09/318,528
 19 <151> PRIOR FILING DATE: 1999-05-15
 20 <150> PRIOR APPLICATION NUMBER: US 09/291,931
 21 <151> PRIOR FILING DATE: 1999-04-13
 22 <150> PRIOR APPLICATION NUMBER: US 09/259,214
 23 <151> PRIOR FILING DATE: 1999-03-01
 24 <150> PRIOR APPLICATION NUMBER: US 08/910,798
 25 <151> PRIOR FILING DATE: 1997-08-13
 26 <160> NUMBER OF SEQ ID NOS: 10
 27 <170> SOFTWARE: FastSeq for Windows Version 4.0
 28 <210> SEQ ID NO: 1
 29 <211> LENGTH: 13.
 30 <212> TYPE: CDS
 31 <213> ORGANISM: Escherichia coli
 32 <214> FEATURE:
 33 <221> NAME/KEY: CDS
 34 <222> LOCATION: 1..(132)
 35 <223> NAME/KEY: misc_feature
 36 <224> LOCATION: 1..16
 37 <230> OTHER INFORMATION: n = A,T,C or G

W--> 52 <400> 1

53	atc aac ggc atc tta atc cca ttt tta tct ctt ctg att ccg tta acc	48
54	Met Lys Ala Ile Leu Ile Pro Phe Leu Ser Leu Leu Ile Pro Leu Thr	
55	1 5 10 15	
56	ccc caa tct gca ttc gct cag agt gag ccg gag ctg aag ctg gaa agt	96
57	Pro Gln Ser Ala Phe Ala Gln Ser Glu Pro Glu Leu Lys Leu Glu Ser	
58	19 20 25 30	
59	gtc gtc att gtc agt cgt cat ggt gtc cgt gct cca acc aag gcc acc	144
60	Val Val Ile Val Ser Arg His Gly Val Arg Ala Pro Thr Lys Ala Thr	

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/866,379C

DATE: 09/05/2003

TIME: 04:01:06

Input Set : A:\09010-029006.txt

Output Set: N:\CRF4\09052003\I866379C.raw

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63          35          40          45
64 caa ctg atg cag gat gtc acc cca gac gca tgg cca acc tgg cag gta 192
65 Gln Leu Met Gln Asp Val Thr Pro Asp Ala Trp Pro Thr Trp Pro Val
66          50          55          60
W--> 69 aaa ctg ggt tgg ctg aca ccg cgn ggt ggt gag cta atc gcc tat ctc 240
70 Lys Leu Gly Trp Leu Thr Pro Arg Gly Gly Glu Leu Ile Ala Tyr Leu
71 65          70          75          80
72 gga cat tac caa cgc cag cgt ctg gta gcc gac gga ttg ctg ggc aag 288
73 Gly His Tyr Gln Arg Gln Arg Leu Val Ala Asp Gly Leu Leu Ala Lys
74          85          90          95
75 aag ggc tgc cgg cag cct ggt cag gtc ggc att att gct gat gtc gac 336
76 Lys Gly Cys Pro Gln Ser Gly Gln Val Ala Ile Ile Ala Asp Val Asp
77          100          105          110
81 gag cgt acc cgt aaa aca ggc gaa ggc ttc ggc gcc ggg ctg gca cat 384
82 Glu Arg Thr Arg Lys Thr Gly Glu Ala Phe Ala Ala Gly Leu Ala Pro
83          115          120          125
85 gac tgt gca ata acc gta cat acc cag gca gat aag tcc agt ccc gat 432
86 Asp Cys Ala Ile Thr Val His Thr Gln Ala Asp Thr Ser Ser Pro Asp
87          130          135          140
89 cgg tta ttt aat cct cta aaa act ggc gtt tgc caa ctg gat aac ggc 480
90 Pro Leu Phe Asn Pro Leu Lys Thr Gly Val Cys Gln Leu Asp Asn Ala
91 145          150          155          160
92 aac gtg act gac ggc atc ctg agc agc gca gga ggc tca att gct gac 528
93 Asn Val Thr Asp Ala Ile Leu Ser Arg Ala Gly Gly Ser Ile Ala Asp
94          165          170          175
97 ttt acc ggg cat cgg caa aag ggc ttt cgc gaa ctg gaa cgg gtg ctt 576
98 Phe Thr Gly His Arg Gln Thr Ala Phe Arg Glu Leu Glu Arg Val Leu
99          180          185          190
101 aat ttt cgg caa tca aac ttg tgc ctt aaa cgt gag aaa cag gac gaa 624
102 Asn Phe Pro Gln Ser Asn Leu Cys Leu Lys Arg Glu Lys Gln Asp Glu
103          195          200          205
105 agc tgt tca tta aag cag gca tta cca tgg gaa ctg aag gtg agc gcc 672
106 Ser Cys Ser Leu Thr Gln Ala Leu Pro Ser Glu Leu Lys Val Ser Ala
107          210          215          220
109 gac aat gtc tca tta acc ggt ggc gta agc ctg gca tca atg ctg aag 720
110 Asp Asn Val Ser Leu Thr Gly Ala Val Ser Leu Ala Ser Met Leu Thr
111 225          230          235          240
113 gag ata ttt ctg ctg caa caa gca cag gga atg cgg gag cgg ggc tgg 768
114 Glu Ile Phe Leu Leu Gln Gln Ala Gln Gly Met Pro Glu Pro Gly Trp
115          245          250          255
117 gga agg atc acc gat tca cac cag tgg aac acc ttg cta agt ttg cat 816
118 Gly Arg Ile Thr Asp Ser His Gln Trp Asn Thr Leu Leu Ser Leu His
119          260          265          270
121 aac cgg caa ttt tat ttg cta caa cgc aag cca gag gtt gcc cgc agc 864
122 Asn Ala Gln Phe Tyr Leu Leu Gln Arg Thr Pro Glu Val Ala Arg Ser
123          275          280          285
125 cgc gcc acc cgg tta ttg gat ttg atc atg gca cgc ttg aag ccc cat 912
126 Arg Ala Thr Pro Leu Leu Asp Leu Ile Met Ala Ala Leu Thr Pro His
127          290          295          300

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RAW SEQUENCE LISTING

DATE: 09/05/2003

PATENT APPLICATION: US/09/866,379C

TIME: 00:01:06

Input Set : A:\09010-029006.txt

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139 cca ccg caa aaa cag gcg tat ggt gtg aca tta ccc act tca gta ctg      960
140 Pro Pro Gln Lys Gln Ala Tyr Gly Val Thr Leu Pro Thr Ser Val Leu
141 305      310      315      320
142 ttt att gcc gaa cac gat act aat ctg gca aat ctc gcc ggc gca ctg      1008
143 Phe Ile Ala Gly His Asp Thr Asn Leu Ala Asn Leu Gly Gly Ala Leu
144 325      330      335
145 gag ctg aac tgg aag ctt ccc ggt cag ccg gat aac aag ccg cca ggt      1036
146 Glu Leu Asn Trp Thr Leu Pro Gly Gln Pro Asp Asn Thr Pro Pro Gly
147 340      345      350
148 ggt aac ctg gtg ttt gaa cgg tgg cgt cgg cta agc gat aac agc cag      1104
149 Gly Glu Leu Val Phe Glu Arg Trp Arg Arg Leu Ser Asp Asn Ser Gln
150 355      360      365
151 tgg att cag ggt tgg ctg gtc ttc cag act tta cag ccg atg cgt cat      1132
152 Trp Ile Gln Val Ser Leu Val Phe Gln Thr Leu Gln Gln Met Arg Asp
153 370      375      380
154 aac ccg ccg ctg tca tta aat aag ccg ccc gga gag gtg aac ctg aac      1200
155 Lys Thr Pro Leu Ser Leu Asn Thr Pro Pro Gly Glu Val Lys Leu Thr
156 385      390      395      400
157 cag gaa gga tgt gaa gag cga aat ggc cag gcc atg tgt tgg ttg gaa      1248
158 Leu Ala Gly Cys Glu Glu Arg Asn Ala Gln Gly Met Cys Ser Leu Ala
159 405      410      415
160 gtt ttt aag caa atc gtg aat gaa gaa cgg ata ccg ggc tgc agt ttg      1296
161 Gly Phe Thr Gln Ile Val Asn Gln Ala Arg Ile Pro Ala Cys Ser Leu
162 420      425      430
163 aga tct cat cac cat cac cat cac taa      1328
164 Arg Ser His His His His His His
165 435      440
166 <10> SEQ ID NO: 2
167 <11> LENGTH: 440
168 <12> TYPE: PRT
169 <13> ORGANISM: Escherichia coli
171 <400> SEQUENCE: 2
17 Met Lys Ala Ile Leu Ile Pro Phe Leu Ser Leu Leu Ile Pro Leu Thr
172 1      5      10      15
173 Pro Gln Ser Ala Phe Ala Gln Ser Glu Pro Glu Leu Lys Leu Glu Ser
174 20      25      30
175 Val Val Ile Val Ser Arg His Gly Val Arg Ala Pro Thr Lys Ala Thr
176 35      40      45
177 Gln Leu Met Gln Asp Val Thr Pro Asp Ala Trp Pro Thr Trp Pro Val
178 50      55      60
179 Lys Leu Gly Trp Leu Thr Pro Arg Gly Gly Glu Leu Ile Ala Tyr Leu
180 65      70      75      80
181 Gly His Tyr Gln Arg Gln Arg Leu Val Ala Asp Gly Leu Leu Ala Lys
182 85      90      95
183 Lys Gly Cys Pro Gln Ser Gly Gln Val Ala Ile Ile Ala Asp Val Asp
184 100      105      110
185 Glu Arg Thr Arg Lys Thr Gly Glu Ala Phe Ala Ala Gly Leu Ala Pro
186 115      120      125
187 Asp Cys Ala Ile Thr Val His Thr Gln Ala Asp Thr Ser Ser Pro Asp

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RAW SEQUENCE LISTING

DATE: 09/05/2003

PATENT APPLICATION: US/09/866,379C

TIME: 01:01:06

Input Set : A:\09010-029006.txt

Output Set: N:\CRF4\09052003\I866379C.raw

```

189      130      135      140
190 Pro Leu Phe Asn Pro Leu Lys Thr Gly Val Cys Glr Leu Asp Asn Ala
191 141      150      155      160
192 Asn Val Thr Asp Ala Ile Leu Ser Arg Ala Gly Gly Ser Ile Ala Asp
193      165      170      175
194 Phe Thr Gly His Arg Gln Thr Ala Phe Arg Glu Leu Glu Arg Val Leu
195      180      185      190
196 Asn Phe Pro Gln Ser Asn Leu Cys Leu Lys Arg Glu Lys Gln Asp Glu
197      195      200      205
198 Ser Cys Ser Leu Thr Gln Ala Leu Pro Ser Glu Leu Lys Val Ser Ala
199      210      215      220
200 Asp Asn Val Ser Leu Thr Gly Ala Val Ser Leu Ala Ser Met Leu Thr
201 225      230      235      240
202 Glu Ile Phe Leu Leu Gln Gln Ala Gln Gly Met Pro Glu Pro Gly Trp
203      245      250      255
204 Gly Arg Ile Thr Asp Ser His Gln Trp Asn Thr Leu Leu Ser Leu His
205      260      265      270
206 Asn Ala Gln Phe Tyr Leu Leu Gln Arg Thr Pro Glu Val Ala Arg Ser
207      275      280      285
208 Arg Ala Thr Pro Leu Leu Asp Leu Ile Met Ala Ala Leu Thr Pro His
209      290      295      300
210 Pro Pro Gln Lys Gln Ala Tyr Gly Val Thr Leu Pro Thr Ser Val Leu
211 305      310      315      320
212 Phe Ile Ala Gly His Asp Thr Asn Leu Ala Asn Leu Gly Gly Ala Leu
213      325      330      335
214 Glu Leu Asn Trp Thr Leu Pro Gly Gln Pro Asp Asn Thr Pro Pro Gly
215      340      345      350
216 Gly Glu Leu Val Phe Glu Arg Trp Arg Arg Leu Ser Asp Asn Ser Gln
217      355      360      365
218 Trp Ile Gln Val Ser Leu Val Phe Gln Thr Leu Gln Gln Met Arg Asp
219      370      375      380
220 Lys Thr Pro Leu Ser Leu Asn Thr Pro Pro Gly Glu Val Lys Leu Thr
221 385      390      395      400
222 Leu Ala Gly Cys Glu Glu Arg Asn Ala Gln Gly Met Cys Ser Leu Ala
223      405      410      415
224 Gly Phe Thr Gln Ile Val Asn Glu Ala Arg Ile Pro Ala Cys Ser Leu
225      420      425      430
226 Arg Ser His His His His His His
227      435      440

```

228 <110> SEQ ID NO: 3

229 <111> LENGTH: 49

230 <112> TYPE: DNA

231 <113> ORGANISM: Artificial Sequence

232 <114> FEATURE:

233 <115> OTHER INFORMATION: primer

234 <400> SEQUENCE: 3

235 gtttttgact tcaaggagga atttaaataa aagcgatctt aatccatt

49

236 <110> SEQ ID NO: 4

237 <111> LENGTH: 33

RAW SEQUENCE LISTING

DATE: 09/05/2003

PATENT APPLICATION: US/09/866,379C

TIME: 09:01:06

Input Set : A:\09010-029006.txt

Output Set: N:\CRF4\09052003\I866379C.raw

```

242 <212> TYPE: DNA
243 <213> ORGANISM: Artificial Sequence
244 <214> FEATURE:
246 <215> OTHER INFORMATION: primer
248 <216> SEQUENCE: 4
249 gttttgtggat ctttacaac tgcacgggg tat
251 <216> SEQ ID NO: 5
252 <211> LENGTH: 1901
253 <212> TYPE: DNA
254 <213> ORGANISM: Escherichia coli
256 <214> FEATURE:
257 <215> NAME/KEY: misc_feature
258 <216> LOCATION: 403
259 <215> OTHER INFORMATION: n = A,T,C or G
261 <216> SEQUENCE: 5
262 ttaggagcag aaacaargtg gtatttaactt tggttgctcg gcattttgtt gatgtgttgg
263 ctctccacccc ttctgttggg atggctggac cggcgctctga aaagttaacy aacgtaggcc
264 ttagtcggggc cattagcactc gcattcaggca atcaataatg tcagatatga aaagcggaaa
265 cttatcgatg aaagcgatct taatcccatt tttatctctt ctgattccgt taaccccgca
266 atctgcattc gctcagagtg agccggagct gaagctggaa agtgtgtgtg ttgtcagtcg
267 ttatgtgttg cgtgctccaa ccaaggccac gcaactgatg caggatgtca cccagagcgc
W--> 268 atggccaacc tggccggtaa aactgggtga gctgacaccg cgnggtggtg agctaatacgc 420
269 ctatctcggg ctttaccacg gccagcgtct ggttagccgac ggattgctgg cgaacaaagg
270 ctgcacccgag ttctgttcagg tcggcattat tgcctgatgt gaagagcgta cccgtaaaaa
271 aggcacagcc ttgcaccccg ggttggcacc tgaactgtga ataacctgac ataccacggc
272 agatagcttc agtcccgatc cgttatctaa tctctataaa actggcgttt gccaaactga
273 taagcgagac ttactgtacg cgtatctcag cagggcagga gggtaaatg ctgactttac
274 cttcactcgg caacggcggt ttgcggaact ggaacgggtg cttaattttc cgcacacaaa
275 ctatgcgctt aaacgtcgga aacaggacga aagctgttca ttaacgcagg cattaccatc
276 ccaactcaag gtagcgcgcg acaatgtctc attaacgggt cgggtaagcc tcgcatcaat
277 gctgacggag atattttctc tgcacacacg acagggaatg cggagacggg ggtggggaag
278 gttccacgat tccacacagt ggaacacctt gctaagtttg cataacgggc aattttatct
279 ctacacacacg acgcacagag ttgcacccag cggcgccacc cggttattag atttgatcaa
280 caacacgttg acgcacacac caccgcaaaa acaggcgtat ggtgtgacat taccacactc
281 atgtctgttt atgcacggac acgatactaa tctggcaaat ctggcgggcg cactggagct
282 caatcggaag ttccacggtc agccggataa caacgcgcga ggtggtgaac tgggtgttga
283 agctcggcgt cggcgaagcg ataacagcca gtggattcag gtttcgctgg tcttccagac
284 tttaacagcag atgtgtgata aaacgcgcgt gtcattaaat acgcgcgcgc gagaggtgaa
285 atgtacccctg ccaggatgtg aagagcgaaa ttgcgagggc atgtgttcgt tggcaggttt
286 taacpcaaac ttgaatgaag caagcatacc ggctgtcagt ttgtaatgca taaaaaagag
287 ctttcagtta cctgaatgct ctgaggttga tgacaaaaga agaactgtct aatgcgtaga
288 cgggaaaagg cgttcacggc gcattccggc actttcagtt tctctcttct cggaggtaac
289 ctataccgta atagtttatg cgttaactgt aagcgggtgt ggcgggttta atccacacat
290 taacgatagc ccttttaata ttgacgcctg cctgttccag acgtgtgcatt gacaaaacta
291 cctcttttgg cgtgttcaag ccaaaaacgc caaccagcag gctggtgcca acagaaacgc
292 ccaacacgcg cgcattcact acgcacagca cggcgggcgt atcgacaatc accagatcgt
293 atgtgtcgtt cgcacattcc agtaattgac gcattccgac g
294 <216> SEQ ID NO: 6
295 <211> LENGTH: 1901

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RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/866,379C

DATE: 09/05/2003
TIME: 09:01:07

Input Set : A:\09010-029006.txt
Output Set: N:\CRF4\09052003\I866379C.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; N Pos. 216
Seq#:5; N Pos. 403
Seq#:6; N Pos. 403
Seq#:7; N Pos. 403

VERIFICATION SUMMARY

DATE: 09/05/2003

PATENT APPLICATION: US/09/866,379C

TIME: 09:01:07

Input Set : A:\09010-029006.txt

Output Set: N:\CRF4\09052003\I866379C.raw

L:52 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:1
L:69 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:192
L:268 M:341 W: (46) "r" or "Xaa" used, for SEQ ID#:5 after pos.:360
L:312 M:341 W: (46) "r" or "Xaa" used, for SEQ ID#:6 after pos.:360
L:352 M:158 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:7
L:372 M:341 W: (46) "r" or "Xaa" used, for SEQ ID#:7 after pos.:373
L:545 M:181 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:548 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:9